

# Documenting Costs Associated With BRD

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## Bovine Respiratory Disease Complex Series



### FAST FACTS

- Cattle in feedlots suffering from BRD are worth \$23-150 less than healthy cattle.

Bovine respiratory disease complex (BRD), sometimes called shipping fever and pneumonia, is an economically important disease and a leading cause of death loss in beef cattle in North America. Survey data suggest that respiratory disease accounts for approximately 29 percent of all calf death losses in the United States (NAHMS, 2011). Bovine respiratory disease is manifested as a complex of several types of infection with specific causative organisms, clinical signs and the related economic impacts.

Organisms reported to be associated with BRD include: Infectious Bovine Rhinotracheitis (IBR), Bovine Viral Diarrhea virus (BVDV), bovine respiratory syncytial virus (BRSV), and parainfluenza type 3 (PI3). In addition, bacterial agents such as *Mannheimia haemolytica*, *Pasteurella multocida*, *Haemophilus somnus*, and mycoplasma are contributing factors (Snowder et al., 2006).

Symptoms of BRD Complex normally appear after weaning, which frequently coincides with shipping, and the complex of symptoms now diagnosed as BRD was often called shipping fever in the past. BRD is remarkably economically damaging.

### FEEDER

Direct losses occur primarily in the feedlot; these include costs of treatment, reduced gains through decreased feed efficiency, lower carcass weights, reduced quality grade, and death loss. BRD is the single largest source of morbidity and mortality in feedlots, causing an estimated \$2-3 billion in losses nationally (Fulton 2009; Irsik 2006). Feedlot cattle have high values and high feed costs so BRD morbidity and mortality losses are magnified.

Developed by WSU Animal Science and Veterinary Medicine Extension

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### FAST FACTS

- Stress is known to be a significant factor in BRD.
- Calves with BRD can have almost 20 pounds lower weaning weights



Cattle in feedlots suffering from BRD are worth \$23-150 less than healthy cattle (Smith 2009). Analysis by McNeil (1996) found that the indirect losses from reduced gains and lower carcass weights (as much as \$150) were more significant than direct treatment costs, which are reported as high as \$45 per head in the feedlot.

### COW-CALF PRODUCER & STOCKER

Beef calves are typically managed for low stress and a clean environment so BRD incidence risk is lower. However beef calves can suffer from respiratory disease prior to weaning. A study of preweaned calves found variance of BRD incidence by year and by day of age (Snowder et al, 2005). The study could not identify the cause of annual BRD incidence variation so weather conditions could not be identified as a statistically significant causal agent. The study identified a peak of preweaned BRD incidence around 120 days of age. This is when calves may be stressed during processing programs such as branding, castration and potentially gathering cattle for an A.I. program. Calf economic losses from having BRD are treatment costs, lower weaning weights of about 16 pounds for infected animals and death loss (Snowder et al, 2005). In another study, the incidence rate of BRD in preweaned calves was almost 12 percent and also identified inter-year variability in BRD incidence rates (Schneider et al, 2010). This study did not identify a significant difference in lower weaning rates, but the infected calves did have an economic treatment cost. An older study evaluated BRD incidence in both pre and post weaned calves and found high incidence in both groups and proposed the potential to breeding for BRD resistance (Muggli-Crockett, Cundiff and Gregory, 1992).

An emerging approach for managing BRD for cow-calf producers is selecting for disease resistant cattle. The positive influence of heterozygosity for decreasing the disease incidence in preweaned calves demonstrates that crossbreeding decreases disease incidence. The heritability estimates suggest a favorable response to selection for disease resistance and research should determine how best to identify the phenotype of resistant animals (Snowder et al 2005). Research on identifying genetic markers for BRD disease resistance is ongoing and can be followed at <http://www.brdcomplex.org/Index.html>.

### REDUCING BRD ECONOMIC COSTS

The primary BRD economic losses are incurred from newly weaned feeder cattle entering stocker and feedlot operations. The highest incidence of BRD occurs shortly after arrival to the feedlot or within the first 45 days (Edwards, 1996; Loneragan et al., 2001). Buhman et al. (2000) reported that about 91 percent of calves diagnosed with BRD were diagnosed within the first 27 days after arrival. Stocker and feeder operations can classify cattle from low to high risk.



### FAST FACTS

- The most successful pre-conditioning programs combine vaccination protocols with a 45-day weaning period prior to shipping.

*Low Risk* – are healthy yearling cattle that have been backgrounded for over 60 days and single sourced preconditioned calves with low transportation stress.

*Medium Risk* – are stressed yearling cattle and single sourced calves that were not preconditioned.

*High Risk* – are freshly weaned and commingled calves under high stress.

There is no effective means to eliminate BRD incidence as cattle are received at stocker and feeder operations. However, reducing BRD incidence is possible through good calf management prior to and at weaning. As the cost of BRD incidence is becoming more widely recognized there is renewed interest in looking at calf preconditioning programs to minimize BRD economic losses. Consequently, the economic analyses for the cow-calf producer sector usually involve premiums paid for calves with low risk for BRD. The prices offered for calves by stockers and feedlots reflect the buyer's perceptions of BRD risk in a group of calves. Negatively, feeders may offer less for calves that are perceived to be at high risk, but this is much more difficult to determine and quantify. Premiums are usually offered through certified preconditioning programs that are recognized by feeders and provide economic incentive to cow-calf producers, such as through special calf sales, although this benefit can be captured through retained ownership as well.

The costs of pre-conditioning or pre-weaning programs are a direct attempt to prevent BRD in the feedlot and may or may not actually generate a return to the cow-calf producer. Price premiums have been well-documented for calves with a low risk of BRD incidence. A study of video auction calf prices from 1995-2005 found premiums of \$2.47-7.91/cwt for calves weaned more than 45 days prior to feedlot entry and vaccinated against BRD. Over the nine-year study period the average premium was \$4 per hundred-weight (cwt). Premiums for cattle vaccinated but not pre-weaned were \$1-3.47/cwt, suggesting that the stress of weaning onto the truck had (negative) economic value significance to the feedlot buyers independent of BRD vaccination. Stress is known to be a significant factor in BRD. These premiums also increased over time, suggesting that the pre-conditioning programs were effective (King 2006).

A synthesis of existing economics literature by Dhuyvetter (2004) found that the price premiums paid by feedlots for various pre-conditioning programs are usually justified. Further, they found that the premiums underestimate the actual value of these programs, and cow-calf producers, under certain market conditions, do well retaining ownership in the feedlot in order to capture this value. However, cow-calf producers are unlikely to capture the costs of preconditioning programs unless they are selling into a program that formally recognizes those treatments.



### FAST FACTS

- A 45-day pre-weaning program is estimated to cost \$35 to 60 per head
- Ranchers should conduct an individual cost-benefit analysis to see if the program will pay for itself

The costs of pre-conditioning or pre-weaning programs are a direct attempt to prevent BRD in the feedlot which may or may not actually generate a return to the cow-calf producer and are therefore a true cost. To accurately evaluate the profit or loss associated with a preconditioning program, producers need to know, or be able to reliably estimate 1) purchase price (for stocker operations) 2) production data such as average daily gain, death loss, morbidity treatment; 3) all costs of the preconditioning program; and 4) the selling price of calves through a special calf sale or with a certified preconditioning program or through a feedlot relationship where there is a premium on preconditioned calves.

A 45-day pre-weaning program is estimated to cost \$35-60 per head (King 2006). This cost includes health supplies, marketing costs, feed/hay/pasture, and labor. It is critical to conduct an individual cost-benefit analysis, given current market conditions, to determine whether a preconditioning program will pay for itself in sufficiently higher sell value. Numerous sample budgets are available to provide a starting point for making these calculations.

### SUMMARY

In summary, feedlots benefit significantly from preconditioning programs paid for by the cow-calf producer, but the cow-calf producer can only capture that benefit if the feeder pays for it through incentive pricing, such as special calf sales or participation in a certification process. The premium should increase with higher calf prices since there is greater incentive to reduce death loss, but the trend seems to be the opposite, that is, historically, premiums fade as market conditions improve for cow-calf producers and calf prices increase.

BRD is a serious animal health problem in the cow-calf, stocker and feedlot cattle production phases and represents the largest single potential risk of financial loss. Cow-calf producers can capture the value of reducing this risk by participating in preconditioning programs that certify the process used to prepare cattle for the feedlot or other commingling events that introduces stressors and novel pathogens. The most successful of these programs combine vaccination protocols with a preconditioning weaning period prior to shipping. Cow-calf producers should evaluate the costs to their own operation and compare these against the price benefits of the preconditioning program.

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